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PSYCHE

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SOCIAL HABITS OF SOME CANARY ISLAND SPIDERS

By William Morton Wheeler.

Bussey Institution, Harvard University

During the summer of 1925, while I was visiting the Canary Islands with my friend, Dr. David Fairchild, as a guest of Mr. Allison V. Armour on his yacht, the "Utowana," my attention was attracted by the peculiar gregarious or social behavior of two species of spiders, *Cyrtophora citricola* Forskål and *Argyrodes argyrodes* Walker. The former was described and figured from the Canary Islands by Lucas as early as 1843 under the name of *Epeira cacti-opuntiæ*[1]. Simon[2] showed that this spider is the same as *Cyrtophora opuntiæ* Dufour, but in his later work[3] he adopts for it an earlier name, *Cyrtophora citricola* Forskål. He cites it as occurring in Corsica, Provence, Spain, Algeria, Sicily, Syria and the Island of Réunion "on cactus, aloes and more rarely on lentiscus." He also gives a brief but accurate account of its web and egg-cocoons, but says nothing about its social proclivities. In the former of the works cited (Vol. V, 1881 p. 16) Simon also mentions *Argyrodes argyrodes* as living "like a parasite on the web of *Cyrtophora opuntiæ*, more rarely on the web of *Epeira adianta*, *Argiope lobata* and *Holocnemus rivulatus*," and as inhabiting Corsica, Spain, Algeria, Sicily, St. Helena, Madagascar, etc.

Lucas merely records *C. citricola* from the Canary Islands, without mentioning particular localities. I saw both it and the *Argyrodes* on three of the islands, namely Teneriffe, Palma and Gran Canaria, but failed to find either of them on Lanzarote.

[1]In Barker-Webb and Sabin Berthelot: Histoire Naturelle des Isles Canaries ,1836-1844, p. 40 Pl. 6, Figs. 7, 7a.

[2]Les Arachnides de Frances I, 1874, p. 34.

[3]Histoire Naturelle des Araignées, 2nd edit. II, 1892-1895. p. 771.

The communal webs of the Cyrtophora are built over bushes or trees and often cover a considerable area. On Teneriffe I found a colony enveloping a long Pelargonium hedge in the garden of the Hotel Martianez at Puerto Orotava, and in front of the same hotel a huge web rising from the summit of a Lonicera hedge to the telegraph wires several feet above it. At Villa Orotava, in what was formerly the garden of the distinguished botanist Wilpret, there was a fine web about twelve feet high and four feet broad spread over the foliage of a cedar tree. On the island of Palma smaller webs were seen on the way-side Opuntia cacti near San Andres and Sauce. On Gran Canaria they were common in the banana plantations and on cacti at Telde, and on a beautiful myrtle hedge in the finca of Don Salvador Manriquez de Lara at Tafira. But the most extensive web was seen on this island near Puerto de la Luz. It completely enveloped a dense hedge of Opuntia fully one hundred feet long and six to eight feet wide. I estimated its area at somewhat more than 1000 square feet.

In all these cases the web was the joint work of dozens or, in the last instance mentioned, of thousands of Cyrotphoras. It consists of two parts, a very irregular structure or framework of long, coarse, yellow and somewhat glutinous threads, running in all directions and attached to the plants, and a variable number of suborbicular, horizontal webs, suspended side by side or one above the other in the frame work. These webs are three to eight inches in diameter and made of very even square meshes, of the size of those of mosquito netting, but consisting of exceedingly delicate, whitish silk. The Cyrphoras rest on the lower, convex surfaces of these webs. Individuals of all ages live together amicably and seem to feed in common on the prey that is caught in the webs, but the adult females, (15 mm. long) which are gray, with large, paired, silver spots on the dorsal surface of the abdomen, are usually few in number. The egg-cocoons are elliptical, about 15 to 20 mm. long, made of dense, coarse, gray-green silk, and are suspended vertically in or near the center of the whole structure. They vary from one to five in number and are attached to one another in a series, so that they resemble a string of minute sausages. The mother

spider is usually found resting at the end of the lowermost cocoon.

The Argyrodes, which are black, with pale legs and extensive silver spots on the abdomen and are very much smaller than the adult Cyrtophoras (adult female only 4.5 mm.; adult male 3.5 mm.), were also present in all the webs which I examined. They seem to make no webs of their own but live in the coarse framework of the structure spun by the larger species. Like the latter, they are present in considerable numbers, of all sizes and of both sexes. They were seen feeding on midges and other small insects caught in the coarse yellow strands. When disturbed they quickly drop to the ground by letting out a thin silken filament, but the Cyrtophoras run off to the side and hide in the foliage of the plant supporting the web. The egg-cocoons of the Argyrodes resemble certain seed-capsules and are of the peculiar type seen in other species of the genus, being small subspherical or pear-shaped, yellowish brown, papery-walled structures. One pole of the capsule is prolonged into a stiff stem, or pedicel by which the capsule is suspended from the threads of the web and at the opposite pole there is a small circular, protruding rim.

The habits of *Cyrtophora citricola* and *Argyrodes argyrodes* thus resemble those of *Nephilla plumipes* and *Argyrodes nephillæ*, which Mr. Nathan Banks and I observed in Panama. In a volume soon to be published[4] I have described the behavior of these spiders and have cited the observations of others on similar gregarious or social habits in the species of Uloborus, Anelosimus, Epeira, Stegodyphus, Cœnothele, etc. in various parts of the world.

[4]Les Sociétés d'Insectes, Doin, Paris 1926.

THE EUROPEAN SUBGENUS ACTEDIUM (BEMBIDION) IN NORTH AMERICA.[1]

By P. J. Darlington, Jr.

In a box of Albertan *Bembidion* recently received for determination from Mr. F. S. Carr, the writer found two specimens of an apparently undescribed species belonging to the subgenus *Actedium* Mots., a group not heretofore recorded from this continent. *Actedium*, which was erected in 1864 (8) for two European species, was defined as follows: elytra subquadrate (presque carré); the striæ distinctly punctured, effaced toward the apex, not deeply impressed, the 7th visible, the third with two small foveæ; head and thorax punctate, the latter cordate with the basal impressions feeble. It may be added that the eyes are prominent, the humeri indistinctly angulate, the 8th stria close to the margin, and the mentum tooth entire and triangular. The two original species of the subgenus, together with a third described from Europe in 1870 (6) and the one described below, form a homogeneous group, the habitus being like that of a very stout *Lachnophorus*.

In comparing *Actedium* to our other groups of *Bembidion*, it seems best to mention the closely related European subgenus *Princidium* Mots. This was described in the same paper as *Actedium*, and was separated from it chiefly by having the form narrower and the elytral striæ entire. The two subgenera together are equivalent to the third group of Jacquelin-Duval's monograph, "De Bembidiis Europæis" (7).

It may be noted at this point that the several American species included in *Princidium* by Motschulsky, notably those now listed as *dilatatum* Lec., *honestum* Say, and *concolor* Kby., have all been referred to *Peryphus* Steph. by Casey (1). Of the two European species placed in Princidium, only one, *punctulatum* Drap., can be retained. The other, *ruficolle* Gyll., has a very different habitus and has the elytral foveæ on the third interval. Since no genotype has been assigned for *Princidium* thus far,

[1]Contribution from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 262.

the writer here designates *Bembidion punctulatum* Drap. as the genotype of that subgenus.

It may also be noted that the species of Jacquelin-Duval's groups four and five, which were associated with group three in his monograph because of the punctuation of the head, all have the elytral foveæ on the third interval, a character noted but not much valued by that author. Since the form described in this paper combines the habitus of *Actedium* with an elytral striation nearly as complete as in *Principidium*, the two subgenera may have to be united under the latter name, which has priority by a page.

The species of *Actedium*, and that of *Principidium* as restricted above, differ from all hitherto described American species of *Bembidion* by having the depressions in the posterior angles of the prothorax entirely obsolete, and by having distinct non-setigerous punctures on the head and the sides of the pronotum. A partial exception is found in *B. scopulinum* Kby., in which there is a tendency toward rugosity on the floor of the frontal sulci, and of which a considerable percentage of specimens have a few scattered punctures on the front. In *B. lævigatum* Say there are a few irregular frontal punctures, but these are setigerous and are not comparable. Several species of the *ustulatum* group have the base of the thorax, and more rarely an area near the apex, rugose; and this, too, is best developed in *scopulinum*. The sides of the thorax, however, are quite impunctate even in this species.

Except for its subdilated hind body and the unique characters noted above, *Actedium* is inseparable from *Peryphus* as the latter is employed by Casey (1); and it seems most closely related to that part of *Peryphus* containing the more convex species of Hayward's (4) *ustulatum* group. *Principidium*, which combines the habitus of a convex *Peryphus* with the technical characters of *Actedium*, brings those two subgenera even closer together. The gap remaining, however, seems too great, particularly as regards the structure of the posterior angles of the prothorax, to allow *Actedium* and *Peryphus* to be united at present. The two subgenera should, of course, be associated on our lists.

Before proceeding to the description, the writer must ac-

knowledge his indebtedness to the authorities of the Museum of Comparative Zoology at Cambridge for the opportunity of examining specimens of all the European species mentioned in this paper, and of referring to the invaluable collections of Leconte and Hayward.

The following species, as already indicated, seems completely congeneric with the European *Bembidion* (*Actedium*) *kusteri* Schaum and *B.* (*Act.*) *pallidipenne* Illig.

Bembidion (Actedium) lachnophoroides n. sp.

Convex, posterior parts robust; head and thorax viridiaeneus; elytra smoky-yellow, with apex and a slightly post-median transverse fascia blackish, the latter slanting slightly forward from the suture. Head as wide as thorax at widest part, strongly alutaceous, rather sparsely punctured with very distinct punctures; frontal striae broad, shallow, and parallel, the floor longitudinally rugose; antennae stout, piceus with the basal joint paler, intermediate joints about twice as long as wide. Prothorax scarcely wider than an elytron, about one eighth wider than long, subcordate, narrower at base than apex, strongly alutaceous; median line well impressed, transverse impressions indistinct; disk impunctate at middle, slightly wrinkled transversely; sides with sparse, large punctures; base and apex strongly and longitudinally rugose; lateral margins narrow; hind angles not striate, slightly obtuse but not rounded, not prominent; basal impressions entirely obsolete except for the slightly broadened margin where the tactile seta arises. Elytra, alutaceous, together one half longer than wide, sides straight and subparallel in median third; humeri not prominent; striae moderately impressed, modertely punctured on basal two thirds; first, second, and seventh distinct at apex, others slightly abbreviated; seventh slightly less impressed on disk than sixth; third with two moderate foveae. Head and thorax piceous or reddish beneath; abdomen entirely flavo-testaceous; Legs entirely pale. Length (♂ ♀) 4.25 mm. Width (♂ ♀) 1.8-1.9 mm.

This species is most closely related to *B. kusteri* Schaum of Europe, but is distinct by the more complete elytral striation, the dark antennæ, the posterior rather than anterior elytral markings, and the pale abdomen. The last character, however, may be due to the immaturity of the types.

Both the ♂ holytope and ♀ allotype were collected by Mr. F. S. Carr at Medicine Hat, Alberta, Sept. 8, 1923. By arrangement with Mr. Carr the holotype will be deposited in the Canadian National Museum; the allotype is in my own collection.

The occurence of European groups, or even species, in North America is a common phenomenon of which *Actedium* is only an additional example (2, 3). The subgenus should be looked for

in the gulf of St. Lawrence region and in Alaska, though it had not been recorded from Siberia up to 1896 (5). more likely to be found in the Salt flats & deserts south of B

The following papers have been referred to, by number, in the proceding pages:

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2. Champion, G. C.—List of Coleoptera common to Britain and North America; Ent. Month. Mag., ser. 2, VI, 1895, p. 150-155.
3. Hamilton, John—Catalogue of Coleoptera common to North America and northern Europe and Asia; Trans. American Ent. Soc., XXI, 1894, p. 345-416.
4. Hayward, Roland—On the species of *Bembidion* of America north of Mexico; Trans. American Ent. Soc. XXIV, 1897, p. 32-143.
5. Heyden, Lucus von — Catalog der Coleopteren von Siberien; Deutche Ent. Zeits. (special no.), 1881; Nachtrag I, 1893; Nachtrag II, 1896.
6. Heyden, Lucus von—Reise nach Spanien; Berlin, 1870, p. 63.
7. Jacquelin-Duval. Camille—De Bembidiis Europæis; Ann. soc. ent. France, sér. 2, IX, 1851, p. 441-576; 1852, p. 101-236.
8. Motschulsky, T. Victor von—Enumération des nouvelles espèces, IV; Bull. Moscou XXXVII, 3, 1864, p. 181 (*Principidium*); p. 182 (*Actedium*).

A NEW GENUS OF CHALCIDOID HYMENOPTERA (CALLIMOMIDÆ)

By T. D. A. Cockerell,

University of Colorado.

Mr. Charles H. Hicks has for many months been studying the insects breeding in dead herbaceous stems. He finds that these will emerge in great numbers during the winter, in the warmth of the laboratory, and as a result he has obtained a a wonderful series of bees and other insects, some new, others permitting the association of sexes, and many connecting parasites with hosts. On Feb. 3, 1926, he bred the insect described below from a stem collected at Boulder, Colorado. It has since been determined to be parasitic on a bee of the genus *Stelis*.

Megormyrus new genus

Female. Elongate, parallel-sided, highly metallic, minutely sculptured, the head and thorax with only very short and thin pale hair; head transverse, broader than long, with large prominent eyes, which are finely, not densely, hairy; front minutely cancellate, transversely striatulate above the antennæ; ocelli large, in a triangle, lateral ocelli about as far from eyes as diameter of an ocellus; cheeks flattened, not at all bulging behind eyes; last joint of maxillary palpi very long; clypeus with some relatively large punctures near margin; mandibles broad, not metallic, the outer surface striate and with a few oval punctures; antennæ placed low down on face, 12-jointed, no ring-joint discernible; flagellum thickly minutely hairy, middle joints longer than broad; terminal cancellate; no parapsidal grooves; hind coxæ extremely large, with a minute reticulate sculpture; femora robust, but not greatly swollen; curved spur of anterior tibia much shorter than basitarsus; tarsi five-jointed, ordinary; wings well developed, hyaline, with a large circular dusky cloud below end of submarginal vein, and a couple of dusky streaks on lower margin at about the same distance from base; marginal

vein about half as long as submarginal; postmarginal about or almost as long as marginal; stigmal moderate, clavate, with an upper lateral pointed projection; abdomen broad, with five tergites visible before the pointed hairy apex; fourth nearly as long as first three together, second much shorter than first or third; sculpture minutely cancellate or reticulate, produciug a dullish surface, but first segment highly polished; hind margins of second and third segments shining; no rows of strong punctures; no trace of a dorsal carina; venter convex, polished, with deep median groove for ovipostor, which is only very slightly exserted at apex.

Megormyrus amabilis n. sp.

Female. Length about 7 mm.; head in front obscure dull green, cheeks shining green; scape chestnut red, flagellum black, suffused with red about middle; thorax dorsally dull obscure greenish, but pronotum somewhat shining posteriorly, postscutellum brilliant purple, metathorax green with rosy patches, sides more brassy; hind coxæ shining green, with a brassy luster; legs (except the green coxæ) bright chestnut red; first abdominal segment highly polished, shining beautiful coppery red, second and third obscurely green, fourth very dark blue, fifth dark blue; venter shining. Stigmal vein 255 microns long; postmarginal about 800, from its end to wing tip about 640. Compared with *Ormyrodes* Brues, it differs by not being coarsely punctured, nor the abdomen excessively elongate; also by the lack of a dorsal keel on abdomen and shorter marginal vein. From *Monobœus* Förster it differs by the sculpture of the abdomen, hairy eyes, and general appearance. In Ashmead's table it appears to fall closest to *Monobœus*, but it is certainly not congeneric with *M. hegeli* Girault, described from Michigan. I have not access to the descriptions of Förster's two species, but as Mayr referred them to *Ormyrus*, they are evidently quite different from the insect now described. In the Colorado fauna, this actually seems closest to the remarkable *Ormyrodes petrefactus* Brues, fossil in the Miocene of Florissant. May we suppose that formerly this group of insects was more abundant, surviving today

in a few isolated and peculiar types, and the widespread and more prolific genus *Ormyrus*? *Ormyrus*, mainly parasitic in cynipid galls[1] has about 45 species; *Monobæus* has three, *Tribæus* one. *Ormyrodes* was based on a species from South Africa; the very similar fossil *O. petrefactus*, from Florissant, is probably not truly congeneric.

[1]Not invariably, *O. sculptilis* Crosby being from *Asphondylia* and *Agromyza*.

WING VEINS OF BEES AS STRENGTHENING ELEMENTS.

CHARLES ROBERTSON,

Carlinville, Illinois.

Lutz (**1**, 182-3) says that if the wing-veins of bees have a function it is probably to strengthen the wing. "However, the 'stingless honey-bees' of the tropics are fairly strong fliers, carry through the air heavy loads of pollen and other material, and are a very successful group, judging by their numbers and their wide distribution, but their wing-venation is so reduced that only a few moderately well-developed cells remain. It would seem from this that the need of an elaborate network of veins to strengthen the wings of bees is not very great, if, indeed, there be such a need." This seems to me an argument from an exceptional case.

The reduction of veins is associated with the importance of the veins as strengthening elements. In **2**, 236, the reduction is stated to be associated with small size.

Families of small bees.—The submarginal cells are reduced to two in Panurgidæ, Dufoureidæ, Macropididæ, Prosopididæ, Pasitidæ and Megachilidæ. The Megachilidæ contain some middle-sized bees, but none equaling the largest of the 3-celled species. The typical forms are small, like *Prochelostoma*, the larger ones being developed from these and retaining the same two cells.

OBLITERATION OR REDUCTION TO STUMPS IN ANAMALOUS CASES.

The second cubital cell.—This is usually the shortest and the transverse cubital veins 1 and 2 are so approximated that, on the presumption of strength, one of them can be dispensed with. Of 289 cases, one of these veins is obliterated in 286 while the 3d transverse cubital is obliterated in only 3. In *Perdita obscurata* the 2nd cubital cell is small and petiolate, indicating that in ordinary Perditinæ the two cells are the 1st and 3rd. In one specimen of *Pseudopanurgus compositarum* transverse cubital vein

2 is represented by a stump so close to the 1st that it would coalesce with it if produced upward. In a specimen of *Phor integer* this cell is petiolate. Of 130 specimens of *Parandrena andrenoides*, which is regularly 2-celled, two show on one side a narrow 2nd cubital cell closed at the top.

Long and short-tongued nest-makers.—Of 216 cases, a transverse cubital vein is obliterated in 215 short-tongued and only one long-tongued, showing that the reduction occurs in the small wings where they are less important elements of strength.

Long and short-tongued inquilines.—While only one long-tongued nest-maker has the veins reduced, 59 long-tongued inquilines have one of them obliterated. On the theory of strength, this may be explained on the ground that strong wings are less important to inquilines. Most inquilines are long-tongued. In the short-tongued Sphecodini, I find 13 specimens with one vein obliterated.

Transverse cubital 2 *obliterated.*—Since the first cubital cell is the longest in all of the 226 cases observed, this vein is the one which can be dispensed with without weakening. Usually obliteration of vein 2 leaves two cells of the same size. Vein 2 is obliterated in 226 cases and 1 in only 60. The 226 cases are Andrenidæ 169, Halictidæ (ex. Sphecodini) 33, Epeolidæ 11, Nomadidæ 6, Sphecodini 3, Colletidæ 3, Euceridæ 1.

Transverse cubital 1 *obliterated.*—Except that it makes the first cell a little larger, it can be dispensed with in second order. It is wanting in 60 cases, while tr. cu. 2 is wanting in 226. The 60 cases are Nomadidæ 40, Sphecodini 10, Halictidæ (ex. Sphecodini) 7, Epeolidæ 2, Andrenidae 1. The obliteration in Nomadidae and Sphecodini is peculiar. This, I think, is the vein wanting in *Prosopis*.

Other veins obliterated.—Transverse cubital 3 is obliterated in 3 cases, 1st recurrent in 1 and 2nd recurrent in 1. Altogether the transverse cubitals 1 and 2 are obliterated in 286 cases, while more useful veins are wanting in 5.

Curiosities.—In *Trachandrena claytoniæ* and *Dialonia antennariæ* tr. cu. 2 is wanting on 1 side, tr. cu. 1 on the other. In two cases, *Oxystoglossa confusa* and *Heminomada obliterata*, both are

wanting on one side. In another case, *Holonomada placida*, they are wanting on both sides.

Veins increased.—In 3 cases the second cubital cell is divided by a vein which appears as a continuation of the 1st recurrent. In another case the upper part of the 3d cubital cell is separated from the lower by a cross vein. So that veins are increased in 4 cases and obliterated in 291.

Enfeeblement of veins.—Instead of proving that the need of strong veins is not great, the reduction in the stingless bees seems to be so unusual as to require an explanation. Comparing with related bees like *Bombus*, *Xylocopa* and *Eulema* would establish a presumption that the reduction is related to the smaller size. The loss of strength comes from a fading out, instead of an obliteration, of the veins. In *Curtisapis*, the third cubital nervure is enfeebled, while in almost all smaller Halictidæ 2 and 3, and the second recurrent, are weaker. In the small *Perditella boltoniæ* the second recurrent vein is almost obsolete. Enfeeblement is pretty regularly correlated with reduction in size.

I have seen bees unable to fly on account of the outer margins being broken. The strength of the nervures may determine how long the wings can be used. Individuals of Meliponidæ may be short-lived. Inquilines have a shorter flight than their hosts, make no nests and have less need for strong wings. They are the almost exclusive long-tongued bees which show anomalous reductions in the venation. In Australia the hive-bee is said to be driving out the native honey-bee. The stronger wings of *Apis* may have something to do with this.

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2. Robertson, C. 1910. Hosts of Strepsiptera. Can. Ent. **42**: 323-30.

DESCRIPTIONS OF A FEW NEW AMERICAN DIPTERA.

By Nathan Banks,

Museum of Comparative Zoology, Cambridge, Mass.

Stratiomyia occidentis sp. nov.

Related to *S. maculosa*, the male having pilose eyes and a black face. It differs from *S. maculosa* most prominently in lacking oblique yellow marks on the fourth segment, and the lateral marks are narrow, almost linear. The lateral appendages of the male genitalia are very much broadened at tip, about twice as broad as in middle, whereas those of *S. maculosa* are scarcely broadened at tip. The hair on the eyes is much shorter than that of *maculosa* and white (not yellowish). The hair on face and thorax is also whiter than in *maculosa*; the scutellum is about half yellow, the marks on the fourth segment do not approach each other, the fifth segment shows but one spot, much broadened behind; the venter is largely yellow, but black on base or lateral parts of segments; femora black, rest of leg tawny.

Length 15 mm.

The type is from Stockton, Utah, June (Spaulding), two other smaller males from Webber Lake, Calif., July (Osten Sacken.)

Odontomyia tumida sp. nov.

In general similar to *O. arcuata* in coloration and structure; the head yellow, with black mark over ocelli, and a curved dark mark each side in front from the eye, basal joint of antennæ pale; thorax rather more silvery pubescent above than in *arcuata*, pleura and sternum yellow, latter black in middle, legs wholly pale, the tarsi hardly darker near tip, scutellum yellow with short yellow spines; abdomen yellow above with four black bands, narrower than in *arcuatus*, and none of them reaching to the margin. It is distinguished from *arcuatus* by the profile of the face, which is fully twice as much swollen out beneath antennæ as in *arcuatus*, projecting forward the width of the eye;

from in front the lower corner of the eyes are as far apart as the length of inner orbit (in *arcuatus* very much closer.)

Calobata kennicotti sp. nov.

Black, face and cheeks silvery, front tawny except the dark triangle, not reaching as far forward as in *C. pallipes*, orbits silvery, occiput black; thorax black, clothed with white pubescence, especially prominent on pleura, on dorsum a bare shining black stripe each side above base of wings; abdomen black above and below, clothed above with prominent white hair, apical segment largely brown, genitalia pale; legs pale, mid and hind tibiæ beneath with dark mark at tip; wings hyaline, second vein ending in costa nearer to tip than to hind cross vein.

Length 5 mm.

Hudson Bay Territory (Kennicott). Separated from *C. pallipes* (*alesia*) by very different genitalia, as well as by marks of thorax. I have not seen *C. nasoni*, but that species is said to have on the genitalia a long filiform process; also to have a process between hind coxæ, and yellow humeri, and the markings on the thorax do not agree, and the venter is pale.

Leria (*Amœbaleria*) **helvola** var. **angustifrons** var. nov.

The types (♂) of helvola have very hairy dorsum and the anterior dorso-central bristles weak, and the front of head, viewed from above is very much broader than long (inner eye-margin). There is in the East another form in which the male has much shorter hair on mesonotum (hardly longer than in other species), the anterior dorso-centrals are much longer, and the front of the head, viewed from above, is but little broader than long (inner eye-margin). The specimens are rather smaller than the typical form. Specimens come from Dead Run, Va., Black Mt., N. Car., Washington, D. C., Ithaca, N. Y. and N. Y. (Osten Sacken).

Eutreta hespera sp. nov.

This is the western form that has passed as *E. sparsa*. It is distinguished by the pellucid dots of the wing, larger, often confluent, those on the posterior part much larger than in *E. sparsa*; there are also pale spots in the costal area, and the costa before the end of the first vein is marked several times with pale; nowhere do the spots tend to form in rows as in *E. sparsa*. The wings are about as broad as in *E. sparsa*, and the clear apex of about the same extent.

Length of forewing 5.5 mm.

From California Julien (Osten Sacken) and Compton (Cole), and Colorado, Manitou.

Eutreta angusta. sp. nov.

Resembles *E. sparsa*, but with narrower body and more slender wings; sides of the abdomen nearly parallel, last segment much longer than broad at base, and more tapering than in *E. sparsa*. Wings about twice as long as broad; the spots rather less scattered, but somewhat in rows, and a few in the costal area, and the costa before end of auxillary is partly pale, the mark at end of the first vein is very small, the clear apical margin is less extensive than in that species.

Length of forewing 4.2 mm., width 2 mm.

From Texas (Lefv.) and one specimen marked "R" and var.? by Loew.

These two species may be tabulated with *E. sparsa* as follows:

1. Costa before end of auxillary vein not marked with pale or but once ..... *E. sparsa*
   Costa marked several times before end of auxillary vein. 2.
2. Wing about twice as long as broad. ..... *E. angusta*
   Wing much broader. ..... *E. hespera*

Eutreta simplex Thomas differs from all of these in lacking the black spots on the face.

NEW SPECIES OF NORTH AMERICAN DOLICHOPODIDÆ

By M. C. Van Duzee,

Buffalo, N. Y.

Hydrophorus maculipennis new species.

Male: Length 3.5 mm.; of wing 4 mm. Face wide, but little narrowed above, upper portion green with only a little pollen; lower part opaque with yellow pollen. Palpi black with pale hairs. Front opaque with brown pollen. Antennæ black, third joint small, nearly round; arista whitish at tip. Cheeks very narrow. Beard yellow, not very long or abundant, the black orbital cilia decend to the middle of the eye.

Dorsum of thorax shining blackish with thin brown pollen, which is more abundant on the sides and ends abruptly a little below the pleural suture; pleuræ bare, more greenish, the pollen white, contrasting strongly with that above; acrostichal and dorsocentral bristles very short, hair-like; propleuræ with one black bristle and some small, pale hairs above each fore coxa; scutellum with two pair of marginal bristles. Abdomen green with brown pollen above, white on the sides, the line between being sharply defined; hairs of the abdomen very minute, black, white only on lower edges of the sides. Hypopygium concealed, with a pair of quite large, black lamellæ projecting backward, they have a few pale hairs on upper edge.

Fore coxæ green, nearly bare, but with a few minute white hairs and several short, black, hair-like bristles on outer edge and one at tip; middle and hind coxæ black with white pollen. Femora and tibiæ green, their hair mostly black. Fore femora thickened, tapering to the tip, with one row of ten black spines extending nearly their whole length on lower anterior edge, lower surface with pale hairs. Fore tibiæ with the usual row of spines on lower surface extending their whole length. Middle and hind femora with several bristles below, their tibiæ with more numerous bristles below, the former with six, the latter with three

bristles on anterior surface. Tarsi black with white pulvilli; fifth joint of middle and hind tarsi very slightly widened. Joints of fore tarsi as 29-14-11-7-10; of middle ones as 33-22-17-10-12; those of posterior pair as 35-23-17-12-16. Calypters yellow with white cilia. Halteres blackish with the stem partly yellow.

Wings grayish, tinged with brown in front of second vein; a dark brown, nearly round spot on the cross-vein and on the middle of last section of fourth vein, this section being nearly straight; veins wholly black, not at all yellow at root of wing.

Described from one male taken at Newport, Oregon, June 8, 1925, by E. C. Van Dyke.

Type in the California Academy of Sciences.

Hydrophorus nigrinervis new species.

Male: Length 3.2 mm.; of wing 4.2 mm. Face wide below, narrowed above, wholly covered with white pollen. Palpi black with black hair. Front opaque with brown pollen. Antennæ black, short, third joint nearly round in outline; arista thick with a bristle-like tip, a little longer than the antenna. Beard scanty, white; the black orbital cilia do not reach down to the middle of the eye. One pair of postverticals. Cheeks extending narrowly below the eyes.

Thorax and abdomen bright metallic green; pleuræ and sides of abdomen dulled with white pollen; propleuræ with one black bristle on each side above fore coxæ; scutellum with two pair of bristles; hair on the dorsum of the abdomen black. Hypopygium black with white pollen, its hair white; its appendages extending downward, as long as height of hypopygium with several long, white hairs at tip.

Fore coxæ green with white pollen and hair; no black bristles at tip; middle and hind coxæ black with white pollen. Femora and tibiæ green, their hair black; fore femora thickened on basal portion, narrowed at tip, with two, closely approximated rows of spines below, one of which extends their whole length; fore tibiæ with a row of short, erect spines on whole lower edge; middle femora with a row of short bristles on lower posterior edge of apical two thirds and three small ones on lower anterior

edge near the tip; posterior femora with a row of six small bristles on lower anterior edge of apical half and three on posterior edge near the tip; fore and middle tibiæ each with five to seven small bristles below. Tarsi black with white hair; middle and hind basitarsi with a row of minute black spines below. Joints of fore tarsi as 31-14-14-10-11; of middle pair as 51-24-20-14-13; those of posterior tarsi as 43-31-24-16-12. Calypters yellow with white cilia. Halteres yellow.

Wings grayish hyaline, without spots on the veins; veins black, not yellow at root of wing; last section of fourth vein nearly straight; third vein bent a little backward at tip.

Female: Length 3.5 mm.; of wing 5 mm. Pollen of face more brown on upper portion, yellow on lower part, becoming white along the orbits, the pollen scarcely concealing the ground color. Fore femora with a single row of spines below in the middle for half their length. Otherwise about as in the male.

Described from two males and one female, taken at Komloops, British Columbia, July 30, by N. Criddle.

Type in the Canadian National Collection.

Hydrophorus albomaculatus new species.

Female: Length 5 mm. of wing 6 mm. Face wide, its sides nearly parallel, opaque with white pollen. Palpi black, their pollen and hair white. Cheeks wide, extending as far down as the tips of the palpi. Front opaque with brown pollen. Antennæ black; first joint as long as the last two taken together; third nearly square in outline; arista thick, as long as the antenna. Beard abundant, long, white; the black orbital cilia decend to apical fourth of the eye; postvertical bristles in a row of four on each side, extending to the orbital cilia.

Thorax blackish with three lines along the rows of bristles which are more gray with pollen; humeri and narrow lateral edges of the dorsum white pollinose; three black propleural bristles above each fore coxa and long white hairs above and below these bristles; scutellum with four pairs of marginal bristles, the outer pair small; there are several small pale hairs on the pleuræ above middle coxæ. Abdomen black, thickly covered

with white pollen, in the type there are many dots where the ground color shows through, its hairs white and conspicuous.

Coxæ, femora, tibiæ and tarsi black with more or less white pollen. Fore coxæ with moderately long, white hair. Fore femora thickened, lower anterior surface with a stripe of numerous, quite long, irregular bristles, extending their whole length. Anterior tibiæ with quite long pale hair on the front surface; all tibiæ and tarsi with minute white hairs below, which are longer on anterior and posterior basitatsi, the latter bent and with several long, black, bristle-like hairs above. Joints of fore tarsi as 46-25-20-14-18; first two joints of middle tarsi as 78-39; joints of posterior pair as 64-43-35-26-22. Calypters, their cilia and the halteres pale yellow.

Wings dark grayish; in front of third vein, except at tip, between third and fourth veins to a short distance before the cross-vein; a roundish spot at anal angle, a spot between fourth and fifth veins before the cross-vein and a small spot between third and fourth veins near their tips whitish, these spots conspicuous without a lens; veins blackish, except sixth vein which is snow white towards its tip; last section of fourth vein somewhat arched.

Described from one female, taken at Aweme, Manitoba, July 12, 1925, by R. D. Bird.

Type in the Canadian National Collection.

Hydrophorus flavipennis new species.

Male: Length 4.5 mm.; of wing 4 mm. Face wide, scarcely narrowed above, green with silvery white pollen, which is most conspicuous around the edge of lower portion. Palpi black with white hair. Front metallic coppery, dulled with grayish pollen. Antennæ black, third joint small, nearly round in outline; arista black with apical half yellowish white. Beard long and abundant, snow white; I can see only about five black cilia on upper orbits.

Thorax green, dorsum with a narrow brown line each side of the acrostichal bristles, and two less distinct lines on each side of these; it has a very little gray pollen; pleuræ with white hair above middle coxæ; propleuræ with long white hair above each

fore coxa, but without a black bristle; dorsocentral bristle next to the scutellum large, the rest very small; scutellum with two pair of bristles. Abdomen coppery with the hind margins of the segments black, its hairs white, short on the dorsum, long on the sides. Hypopygium concealed, with a pair of long black appendages projecting downward with a small tip turned forward, fringed with small white hairs.

Fore coxæ dark green, their long hair and the pollen silvery white; middle and hind coxæ black. All femora and tibiæ dark green with white hair; fore femora thickened, their tips narrowed; they have eight short, blunt spines before the middle on lower surface, the first placed a considerable distance from base of femora; posterior femora with a conspicuous bend near the base, the concave side down, beyond this bend they are a little thickened. Fore tibiæ with a row of minute spines on their whole lower edge; middle tibiæ with two minute black bristles above near the base, posterior pair with several very small ones on upper surface. Tarsi black with white hair, first four joints of middle and hind tarsi with minute black spines below; fifth joint of middle tarsi slightly widened. Joints of fore tarsi as 25-18-13-9-12; of middle ones as 38-18-13-8-12; those of posterior pair as 50-25-20-12-14. Calypters and halteres yellow, the former with white cilia.

Wings with a yellowish sheen on anterior half, posterior half more gray; costa and veins bright yellow, veins on posterior half usually more brownish.

Female: Length 4.5 mm.; of wing 5 mm. Face and front very wide, covered with yellowish pollen, the bronze ground color showing through, except on lower portion, the face long, reaching nearly to the lower corner of the eyes; the black cilia reach down to the middle of the eye; pollen on the dorsum of the thorax more dense than in the male, fore coxæ with shorter hair; fore femora with two rows of spines below for nearly their whole length; posterior femora not bent at base; all tibiæ and middle and hind femora with a few scattering black bristles. Wings, hairs of the abdomen, legs and feet as in the male.

Described from one male and six females which I have taken, the male and two females (type and allotype) taken at

Wainfleet, Ontario, July 20 and 26, 1924; two females at Ridgeway, Ontario, July 24, 1910; one at Buffalo, October, 18, 1910, and one female at Needles, California, February, 18, 1915.

Type in the author's collection.

Hydrophorus lividipes new species.

Male: Length 4 mm.; of wing 5 mm. Face wide with silvery white pollen, the blue-green ground color showing through a little on upper portion. Palpi black with abundant black hair. Front opaque with brown pollen. Antennæ black, short; third joint scarcely as long as wide. Beard rather long, yellowish; the black orbital cilia extend down nearly to the lower margin of the eye. Cheeks wide, extending lobe-like below the eyes, about as long as the palpi.

Dorsum of thorax and its pollen brown; pleuræ green with white pollen, bare, one propleural bristle on each side and several pale hairs below them; two pairs of scutellar bristles. Dorsum of abdomen brown with slight green reflections and brown pollen; its sides shining green with only a little white pollen on lower edges; hairs on first segment long and white; on the others short, black. Hypopygium and its pollen brown, its appendages small, extending downward, scarcely as long as wide, with a little point at tip extending forward, fringed with short hair.

Fore coxæ green, anterior surface with white hair and pollen and a row of about five small black bristles of equal length on outer edge of apical half; middle and hind coxæ black with white pollen. All femora and tibiæ dark blue-green with black hair, each with several small bristles below. Anterior femora thickened, narrowed towards their tips; I can see only one row of spines on lower surface, which are on the anterior edge and placed rather far apart (there may be another row), they also have pale hair on lower surface, fore tibiæ with pale hair on the sides. Tarsi black with brown pollen; first joint of middle and hind pairs with very small spines below, the latter also have pale hair on lower surface. Joints of fore tarsi as 36-17-15-12-13; of middle ones as 44-27-21-15-16; those of posterior pair as 48-30-23-15-15. Pulvilli of all tarsi large, pale in color. Calypters yellow

with reddish border and white cilia. Halteres blackish, stem yellow in the middle.

Wings grayish, strongly tinged with brown in front of third vein as far as tip of second; veins without spots; last section of fifth vein straight, third considerably bent back near the tip; veins wholly black.

Described from a single male taken at Aweme, Manitoba, April 8, 1925, by N. Criddle.

Type in the Canadian National Collection.

Hydrophorus argentifacies new species.

Male: Length 2.7 mm.; of wing 3.5 mm. Face wide below, narrowed above, silvery white, slightly brown just below the antennæ, in certain lights it is tinged with green because of the ground color. Palpi black with gray pollen and pale hair. Front green with brown pollen, antennæ black, short, third joint nearly round in outline. Beard yellow, the black orbital cilia decend to about the middle of the eye. Cheeks narrow, truncate below.

Dorsum of thorax and its pollen brown; pleuræ and abdomen green, dulled with white pollen, the latter with black hair, except on lower edge of the sides; propleuræ with one black bristle and several white hairs on each side above fore coxa; sides of pleuræ bare; scutellum with two pair of marginal bristles. Hypopygium black, its appendages short, rounded, about as long as wide, with only short hair on apical edge.

Fore coxæ green with yellowish hair on anterior surface, no black bristle at tip; middle and hind coxæ black with gray pollen. Femora and tibiæ green with black hair, except on anterior tibiæ. Fore femora thickened on basal portion, narrowed at tip; they have a few short spines below, apparently in a single row (cannot see them very well in the type), their tibiæ with the usual row of spines below; middle and hind femora without a bristle below, except a small one near the tip, posterior tibiæ without, middle ones with one small bristle below, tarsi dark brown; fifth joint of middle ones black and slightly widened. Joints of fore tarsi as 30-16-15-10-12; of middle ones as 43-18-15-10-8, fifth joint 5 wide; posterior tarsi with their joints as 43-24-19-11-10. Calyp-

ters yellow with white cilia. Halteres yellow, knobs darker, but scarcely blackened.

Wings grayish, darker on anterior half; cross-vein bordered with brown a very little; last section of fourth vein straight; third vein bent backward a very little at tip.

Female: Length 3 mm.; of wing 4 mm. Face wider, dark gray. Front opaque with brown pollen; hair on fore coxæ a little more yellowish than in the male. Fore femora with a row of four quite long bristles below and a stripe of very short spines on lower anterior surface; fifth joint of middle tarsi not widened; last section of fourth vein with a very faint cloud at its middle; halteres wholly yellow. Joints of fore tarsi as 32-17-13-9-12; of middle ones as 47-26-17-11-13, those of posterior pair as 41-32-21-12. Otherwise about as in the male.

Described from one pair, taken at Treesbank, Manitoba, September 16, 1925, by N. Criddle. They are in the Canadian National Collection.

TWO VAGRANT GRASSHOPPERS AND A MOTH.

By A. P. Morse,
Peabody Museum, Salem, Mass.

Schistocerca vaga Scudder

Scudder's appellation "wandering," applied to this species, is verified by the recent capture of an adult living female in Salem, Mass., Jan. 28, 1926. It was found in a shipment of cauliflower from California by Leonard Kobuszewski, a clerk in Tassinari's market and fruit-store, Essex St., Salem.

Neoconocephalus triops Linné

Three weeks later, Feb. 19, 1926, a living male of this species was found in a lot of spinach from Texas at the same place by the same person. This species has been taken in New England twice before under similar circumstances (see my Manual of the Orthoptera of New England, p. 358).

Ceramidia viridis Druce.

On April 1 following, a specimen of this black moth was found in bananas, probably from Costa Rica, by Mr. George Tassinari. Mr. C. W. Johnson, to whom I am indebted for its determination, tells me that an example of this species has previously been taken at Nantucket.

All three specimens have been placed in the local collection (Essex County, Mass.) of insects of the Peabody Museum, Salem.

UNDESCRIBED SPECIES OF DICRANOPTYCHA FROM EASTERN NORTH AMERICA (TIPULIDÆ, DIPTERA).[1]

By Charles P. Alexander,

Amherst, Mass.

While revising the species of the crane-fly genus *Dicranoptycha* in my collection, a few species that had not been described were noted and their diagnoses are given in this paper. The material upon which the descriptions are based was largely included in the writer's collection and in a very extensive series of these flies collected in Indiana, Tennessee, North Carolina, Georgia and Florida by Prof. J. Speed Rogers of the University of Florida. Specimens of *Dicranoptycha septemtrionis* were taken by Dr. Crampton and by Mr. M. C. Van Duzee. I express my sincere thanks to all of the above named gentlemen for their cooperation in this matter.

The crane-flies of the genus *Dicranoptycha* are eminently characteristic of open Austral woodlands, often occurring far from running water. The immature stages of certain species, at least, are spent in dry soil in habitats such as the above. Recent papers by the writer on the Eastern species are included in the following references: Entomological News, 30: 19-22; 1919. Pomona Journal of Entomology and Zoology, 11: 67-74; 1919. Cornell University Agr. Expt. Sta., Memoir 38: 829-830; 1920.

The structure of the male hypopygium offers the best characters for the differentiation of some of the otherwise very similar species. In general, the basistyles are unarmed and do not offer good specific characters. The two dististyles are broadly joined at base, the outer more or less heavily chitinized and armed in various ways with teeth and erect setulæ. The shape of this style and its armature is of prime importance in defining the various species. In *D. tigrina* Alex., *D. minima* Alex. and *D. pallida*, sp. n., there are no denticles on the outer margin of the style. The inner dististyle is more fleshy and differs in shape in

[1]Contribution from the Department o Entomology, Massachusetts Agricultural College.

the various forms. At the base of the mesal face of the basistyle but not connected with it, nor, apparently, connected with the tergite, lies a pale flattened rod that is termed herein the *lateral process*. From its position it appears to be an *interbasal process* but from its location in membrane rather removed from the basistyles, I hesitate to call the structure an interbase. The shape of these lateral processes differs much in the various species. The aedeagus and surrounding apophyses vary greatly and offer remarkable characters. The largest aedeagi are found in *D. sobrina* O. S. and *D. megaphallus*, sp. n. In most of the other species, the organ is relatively small and insignificant. The gonapophyses are greatly produced and bifid at their tips in *D. tigrina* Alex.

Dicranoptycha australis sp. n.

Male.—Length 9-9.5 mm.; wing 8.5 mm.

Female.—Length about 8-8.5 mm.; wing 8-8.3 mm.

Generally similar to *D. sobrina* O. S., differing especially in the hypopygial characters.

Basal two segments of antennæ obscure yellow, the flagellum abruptly dark brown. Head and thorax light gray, the præscutum with a very ill-defined grayish brown median stripe. Pleura light gray. Legs with the coxæ sparsely pruinose; trochanters obscure yellow; femora and tibiæ obscure yellow, with darker setæ; terminal tarsal segments passing into dark brown. Wings with the costal fringe (♂) relatively short and inconspicuous; membrane strongly suffused with brownish yellow, the costal region clearer yellow; veins brown. Venation: *Rs* shorter than the elongate cell 1*st* M_2, sometimes angulated and spurred at origin.

Abdominal tergites pale to medium brown; segment seven blackened; eight dark brown; hypopygium and sternites pale. Male hypopygium with the outer dististyle relatively small, gradually narrowed and gently curved to the long acute apical spine; outer surface with short, dense, erect setæ; distal half with microscopic appressed serrulations. Inner dististyle stout, the apex suddenly enlarged, provided with coarse setæ. Aedeagus

relatively small and inconspicuous, the apex rounded. Lateral processes with the apex of each not evenly rounded but directed slightly lateral, the mesal edge rounded, the lateral edge nearly straight to appear like a pruning-knife.

Habitat.—South-eastern United States.

Holotype, ♂, Gainesville, Florida, April 15, 1922 (J. S. Rogers); No. 43.

Allotype, ♀, Ocmulgee Valley, Bibb Co., Georgia, June 3, 1923 (J. S. Rogers); No. 4.

Paratopotypes, 6 ♂ ♀; paratype, 1 ♂, with the allotype.

Type returned to Professor Rogers.

Dicranoptycha septemtrionis sp. n.

Generally similar to *D. sobrina* O. S.; mesonotum dark brown, sparsely dusted with gray; pleura pruinose; femora and tibiæ yellow, the terminal tarsal segments dark brown; wings tinged with yellow, with a faint brown tinge; abdominal tergites brown, segments seven and eight dark brown; male hypopygium with the outer dististyle rather strongly curved, the blackened apex microscopically serrulate on all surfaces; ædeagus small and inconspicuous, about equal in size to the lateral process.

Male.—Length 7-7.5 mm.; wing 8.5-9 mm.

Rostrum brownish gray, the palpi drak brown. Antennæ with the basal segments light yellow, the flagellar segments gradually passing into brown. Head yellowish gray.

Pronotum dark, dusted with gray. Mesonotal præscutum dark brown, sparsely dusted with gray, especially on the humeri; scutellum and postnotum gray dusted. Pleura pale, the dorsal pleurites darker, the entire surface sparsely pruinose. Halteres pale, the knobs weakly infuscated. Legs with the coxæ and trochanters yellow; femora and tibiæ yellow; basitarsi yellow, the tips and remainder of the tarsi dark brown. Wings with a yellowish tinge, weakly suffused with brown, the costal region clearer yellow; veins pale brown, those of the costal region more yellowish. Costal fringe (♂) relatively short. Venation: *Rs* longer than cell 1*st* M_2, the latter rectangular; *m-cu* shortly beyond the fork of *M*.

Abdominal tergites brown, segments seven and eight dark brown, segment nine slightly paler; remainder of hypopygium yellow; sternites brownish yellow. Male hypopygium with the outer dististyle relatively short, rather strongly curved to the acute tip, with about the distal half to third of the style blackened; base of style with microscopic setulæ that become longer, more conspicuous and suberect outwardly, the surface of the style in the blackened portion microscopically serrulate on all surfaces. Inner dististyle longer, fleshy, with conspicuous setæ, the style gradually narrowed to the blunt apex. Aedeagus small and inconspicuous, subequal in size to one of the lateral processes, the latter broad at base, thence gradually decreasing to the narrowly obtuse apex.

Habitat.—North-eastern United States.

Holotype, ♂, Greenfield Mt., Franklin Co., Massachusetts, September 6, 1925 (G. C. Crampton).

Paratopotypes, ♂ ♀, August 23-September 6, 1925 (C. P. Alexander); paratype, ♂, Niagara Falls, New York, September 6, 1911 (M. C. Duzee).

Type in the writer's collection.

All of the records for *D. sobrina* O. S. in my "Crane-flies of New York," Part I, Cornell University Agr. Expt. Sta. Mem. 25: 797; 1919, pertain to this new species. Material was sent to various collections in 1925 with the determination of *D. sobrina*. The species flies late in the season and all of those seen alive by the writer occurred near sluggish streams of water, usually at the foot of wooded hillsides.

Dicranoptycha megaphallus sp. n,

Male.—Length about 8 mm.; wing 9.2 mm.

Generally similar to *D. sobrina* O. S., differing conspicuously in several features, notably the short costal fringe of the male and the spinulose outer dististyle of the male hypopygium.

The head and thorax of the type are greasy and the coloration is discussed in general terms only. Antennæ with the scapal segments light yellow, the flagellum darker. Head dark, any normal pruinosity destroyed. Thorax dark colored, un-

doubtedly pruinose in fresh specimens; sternopleurite paler than the remainder of the pleura. Halteres pale, the knobs slightly darkened. Legs with the coxæ and trochanters obscure yellow; femora yellow, including the fore femora; tibiæ and tarsi yellow, the terminal tarsal segments passing into dark brown. Wings with a grayish yellow tinge, the base and costal region clearer yellow; veins brown, more yellowish in the costal region. Venation: *Rs* shorter than cell 1*st* M_2, the proximal end of the latter more arcuated; *m-cu* a little less than its own length beyond the fork of *M*.

Abdominal tergites brown, the lateral margins narrowly paler; segments six and seven dark brown, eight and nine, with the hypopygium, yellow; sternites yellowish brown. Male hypopygium with the outer dististyle relatively long and slender, the distal half or less blackened and armed with small but conspicuous spinules, those on the outer face more nearly erect; basal half of style on outer face with short, dense, erect setulæ. Inner dististyle broad basally, narrowed apically, the tip a little expanded. Aedeagus very large, on slide appearing rectangular, the tip subtruncate, pale. Lateral processes evenly rounded at tips.

Habitat.—Tennessee.

Holotype, ♂, Allardt, Fentress Co., at light, altitude 1650 feet, June 10, 1924 (J. S. Rogers); No. 11.

Type returned to Professor Rogers.

Dicranoptycha pallida sp. n.

Generally similar to *D. winnemana* Alex., in the pale coloration; legs yellow, the tips of the tibiæ and the basal segments of tarsi narrowly darkened; wings with a strong yellow tinge; costal fringe (♂) short; abdomen (♂) with only the eighth segment darkened; male hypopygium with the outer dististyle smooth on the outer convex face; ædeagus small; a single small, median gonapophysis.

Male.—Length about 7-7.2 mm.; wing 7.2-7.8 mm.

Female.—Length 9-9.5 mm.; wing 8-8.5 mm.

Rostrum and palpi dark brown. Antennæ with the basal segments obscure yellow, only the outer flagellar segments more infuscated. Head brownish yellow.

Mesonotum shiny brownish yellow, the pleura light gray pruinose. Halters pale, the knobs slightly infuscated. Legs with the coxæ slightly pruinose; trochanters obscure yellow; femora yellow, with conspicuous erect setæ; tibiæ and tarsi light yellow, the tips of the individual segments weakly infuscated; terminal tarsal segments uniformly infuscated. Wings with a strong brownish yellow suffusion, the costal region clearer yellow; veins dark yellow. A few trichiæ at ends of both anal veins. Costal fringe (♂) relatively short. Venation: *Rs* considerably longer than cell 1*st* M_2.

Abdominal tergites brownish yellow, segment eight conspicuously dark brown; ninth tergite and the hypopygium light yellow; sternites paler yellow. Male hypopygium with the outer dististyle of moderate length, gently curved to the acute tip, the outer margin entirely smooth, the inner margin with only a few weak denticles on the distal quarter before the spinous apex; vestiture of style barely visible, under high magnification appearing as microscopic setulæ. Inner dististyle stout, gradually decreasing in diameter outwardly, clothed with conspicuous slender setæ, those at the apex only a little stouter. Aedeagus small, relatively slender. A single gonapophysis, the tip of which is bent ventrad toward the ædeagus. Lateral process with the apex evenly rounded.

Habitat.—Kansas.

Holotype, ♂, Lawrence, Douglas Co., altitude 900 feet, August 1, 1918 (C. P. Alexander).

Allotopotype, ♀, July 16, 1918.

Paratopotypes, 10 ♂ ♀, July 16-August 1, 1918.

Type in the writer's collection.

This is the species (Kansas material only) discussed in earlier papers by the writer as being *D. winnemana* Alex. (Ent. News, 30: 19-21; 1919—Pomona Journ. Ent. and Zool., 11: 67-74; 1919—Cornell Univ. Agr. Expt. Sta., Mem. 38: 829-830; 1920).

SPIDERS EATING SNAKES.

In a communication to the Biological Society of Sao Paulo, Brazil, July 8, 1925, Drs. Brazil and Vellard give an account of a spider which eats snakes, frogs and lizards in preference to insects. I am indebted to Dr. Amaral from Brazil who is now in Cambridge for translation of part of this paper.

The spider, *Grammostola acteon* Pocock, is one of the large Avicularidæ commonly known as "tarantula." The body of a male is 60 mm. in length, the thorax 24 mm., the abdomen 36 mm., the legs 60 to 72 mm. The female is somewhat larger with shorter legs.

One of these spiders, kept in confinement, refused for some time to eat insects which were offered to it. One day a small frog was put in with it and the spider at once pounced upon it, crushed it with its jaws and fed upon it. The same experiment with other individuals and other kinds of frogs showed that the spiders preferred the frogs to insects. Small snakes were then given to them, and they took these as readily as they did also small lizards.

When a *Grammostola* and a young snake are put in a cage together the spider tries to catch the snake by the head and will hold on in spite of all efforts of the snake to shake him off. After a minute or two the spider's poison takes effect, and the snake become quiet. Beginning at the head, the spider crushes the snake with its mandibles and feeds upon its soft parts, sometimes taking 24 hours or more to suck the whole animal, leaving the remains in a shapeless mass.

In a large cage with snakes 25 to 45 centimeters long, frogs and insects, the spiders will generally neglect the insects.

The *Grammostola* does not feed with much regularity. One individual took 48 hours to suck a frog 6 cm. long. Two days later it ate a small snake, *Crotalus terrificus*, on the third day a frog, *Cyclorhamphus*, and the next day a snake, *Bothrops jaracara*, after which it was two weeks before it ate again.

J. H. Emerton.

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